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Agromet Database. I: Concept and Aims

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SUMMARY

The concept of using a database within the Agricultural Meteorology Section is discussed. The present system for providing and disseminating agromet data has become inefficient and the use of a database will allow for considerable improvement in the provision of current and future services. Further objectives and user requirements may also be met by the Agromet Database.

1. Introduction

During the latter half of 1983 the Meteorological Office Study Group on Dissemination of Agromet Data identified the design and implementation of an agrometeorological database as essential elements of any plan that sought to improve support to agrometeorologists at Headquarters and outstations, and to other customers for agrometeorological information. A rough estimate of 2-3 man years work for the whole task was put forward. The purpose of this note is to describe the concept and the aims of constructing the database.

2. Concept

For many years members of the agricultural community have relied on agrometeorologists to give reliable up-to-date information on a wide range of agricultural and meteorological topics.

To assist the agrometeorologist in his task a large amount of data processing is necessary on a daily basis to provide the relevant information. Most of the services currently provided have accumulated piecemeal over the past few years and, consequently, the system has become increasingly inefficient. With many more new services envisaged in the future a means of streamlining both the provision and dissemination of services/data is necessary.

The utilisation of a database allows such streamlining provided that future requirements can be estimated and adequate storage set aside for them. Storage of data for previous seasons is also possible thereby increasing the viability of the database to the agrometeorologist.

The concept of large databases is relatively new, only having come about with the advent of computers large enough to store huge amounts of on-line data. However, large storage capacity is not enough. The database must be well designed to allow fast and efficient access of data bearing in mind the requirements of the user.

3. Initial Study

Before any database design could commence it was necessary to carry out an initial study. The two main objectives of this study were to produce the following:

- i. A description of how the existing programs and data sets may be incorporated into or replaced by the database thereby improving the efficiency of the current system.
- ii. An outline of the new system incorporating the database.

Figure 1 shows a flowchart of the current agrometeorological data provided routinely for use by ADAS and other customers.

For each set of calculations data are extracted from Met. Office data banks (eg Synoptic Data Bank (SDB) and National Climatological Messages (NCM)) and the results are stored before being transmitted to customers either by telex or post.

Figure 2 shows a streamlined flowchart for data storage and dissemination using the Agromet Database. The data flow is very much simpler than for the current system. Most noticeably no duplication of data extraction occurs. Extraction will take place once daily and all calculations will utilise this stored data.

More importantly the whole system is automated. Reports will be routinely produced without user intervention and necessary recalculations due to the initial use of incorrect data will be handled much more efficiently than at present.

Figure 3 shows the proposed role of the database within the Agriculture Section. The area enclosed by the dotted line is designated the 'system boundary' and it is within this boundary that all processes affecting the database take place. Users may work interactively with the database unlike at present where batch jobs must be submitted to retrieve and analyse data. All interactive work may be carried out without the fear of contaminating the stored data.

4. Further Aims

Further objectives to be met in replacing the present system are:

- i) Improved data substitution procedures for missing data using biased near-neighbour location values. The current method is very crude with no more than straight substitution values being used from pre-selected near-neighbour locations.

ii) The inclusion of MORECS (weekly and monthly), climatological and radar rainfall data on the database.

iii) To allow for the future expansion of services, eg much room has been designated for the storage of agrometeorological products.

Having identified the aims of the new system the logical design of the database could then proceed.

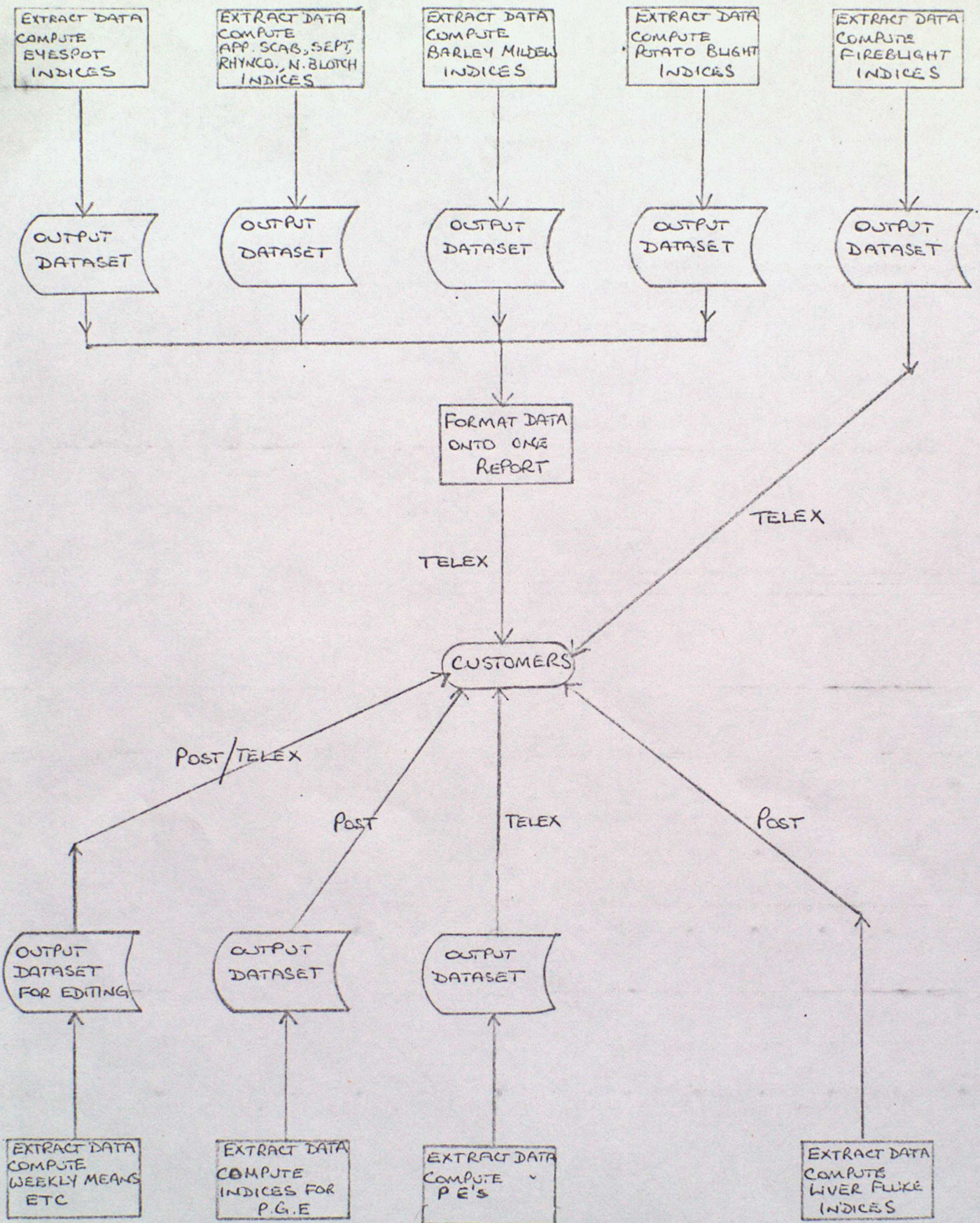
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Any comments or queries on this paper should be referred to the author.

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DAILY



WEEKLY

MONTHLY

Fig. 1 Flowchart of routine Agromet data currently in use by Agriculture Section

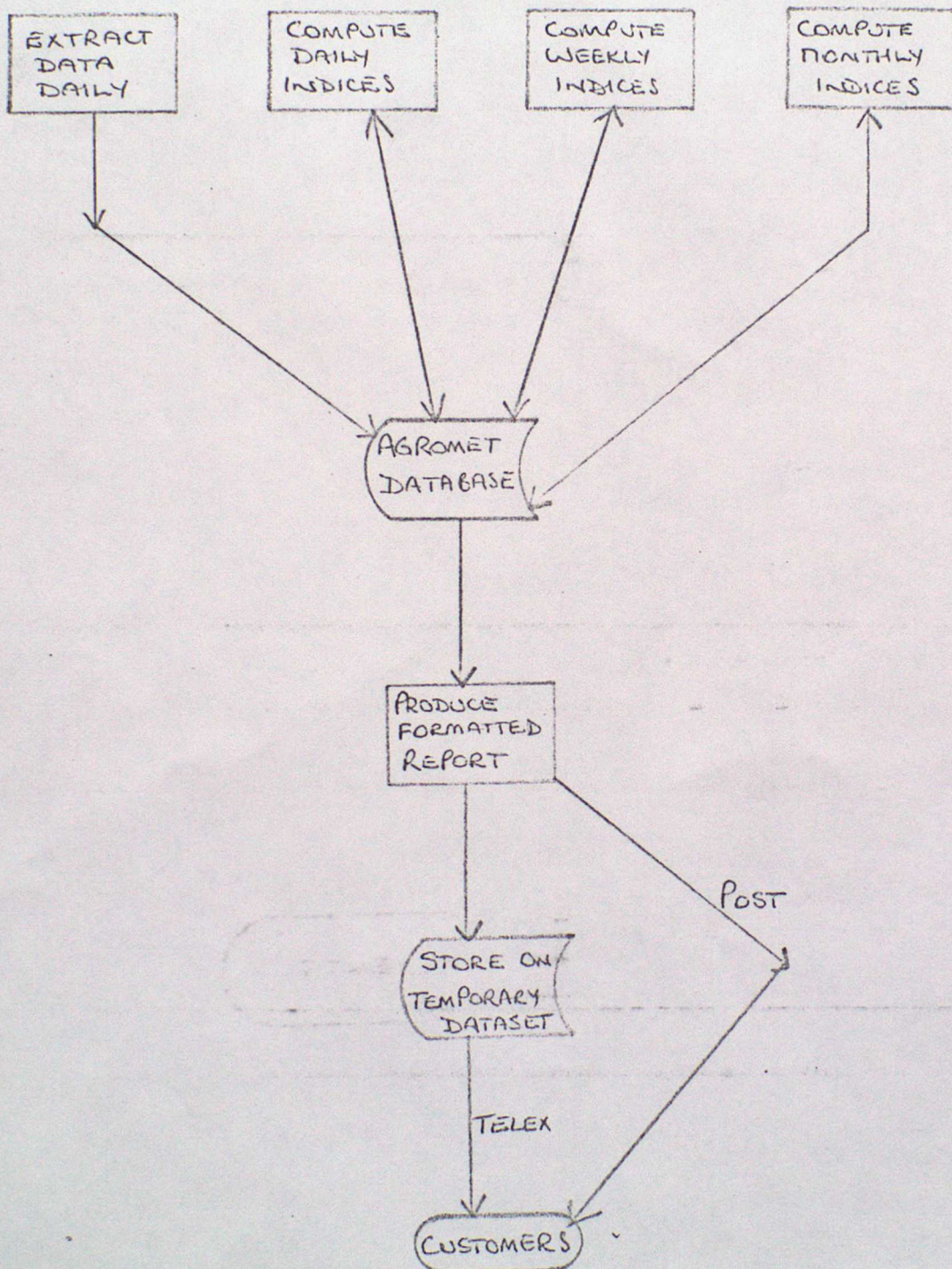


Fig. 2. Flowchart of routine Agromet data using Agromet Database.

